

Claims

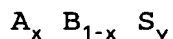
1. Catalyst that comprises at least one zeolite Y that is at least partially dealuminified, whose mesh parameter is between 2.424 nm and 2.455 nm, and whose overall $\text{SiO}_2/\text{Al}_2\text{O}_3$ molar ratio is greater than 8, at least one matrix that is selected from the group that is formed by the mineral matrices, at least one mixed sulfide phase that comprises sulfur and at least one element of group VB as well as at least one element of group VIB, at least one metal of group VIII and optionally at least one element that is selected from the group that is formed by silicon, boron or phosphorus, and optionally at least one element of group VIIA of said classification.

2. Catalyst according to claim 1, such that the element of group VB is niobium.

3. Catalyst according to one of claims 1 or 2, such that the element of group VIB is molybdenum or tungsten.

4. Catalyst according to one of claims 1 to 3 that comprises a mixed sulfide phase of niobium and molybdenum.

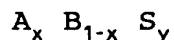
5. Catalyst according to one of claims 1 to 4 that comprises a mixed sulfide phase of the following approximate general formula:



where:

- x is a number between 0.001 and 0.999,
- y is a number between 0.1 and 8,
- A is the element of group VB,
- B is the element that is selected from group VIB.

6. Catalyst according to one of claims 1 to 4 that comprises a mixed sulfide phase of the following approximate general formula:



where:

- x is a number between 0.05 and 0.95,
- y is a number between 0.5 and 4,
- A is an element of group VB,
- B is an element that is selected from group VIB.

7. Catalyst according to claim 6, such that said metal of group VIII is selected from the group that is formed by iron, cobalt, nickel and ruthenium.

8. Catalyst according to one of claims 1 to 7, in which the matrix is alumina.

9. Catalyst according to one of claims 1 to 8 that also comprises at least one element that is selected from the group that is formed by silicon, boron or phosphorus.

10. Catalyst according to one of claims 1 to 9 that also comprises at least one element of group VIIA.

11. Catalyst according to one of claims 1 to 10 that contains in % by weight relative to the total mass of the catalyst:

- 0.1 to 99.9% of at least one matrix,
- 0.1 to 99.8% of at least one zeolite Y that is at least partially dealuminified, whose mesh parameter is between 2.424 nm and 2.455 nm, and whose overall $\text{SiO}_2/\text{Al}_2\text{O}_3$ molar ratio is greater than 8,

- 0.1 to 99.5% of at least one mixed sulfide phase of at least one element of group VB and at least one element of group VIB,

whereby the catalyst can also contain:

- from 0.1 to 20% of at least one metal of group VIII,
- from 0 to 20% of at least one element that is selected from the group that is formed by boron, phosphorus and silicon, and
- from 0 to 15% of at least one element that is selected from group VIIA.

12. Process of preparation of the bulk mixed sulfide phase in the catalyst according to one of claims 1 to 11 that comprises the following stages:

a) A reaction mixture that contains at least the following compounds is formed: at least one element source of group VB, at least one element source of group VIB, at least one source of an element that is selected from the group that is formed by the elements of group VIII, optionally water, optionally at least one source of an element that is selected from the group that is formed by silicon, phosphorus and boron, optionally an element that is selected from among the halogens, i.e., the elements of group VIIA,

b) said mixture is kept at a heating temperature that is generally greater than about 40°C, at a pressure that is at least equal to the atmospheric pressure and in the presence of a sulfur compound until said mixed sulfide phase is obtained.

13. Process of preparation of the supported mixed sulfide phase in the catalyst according to one of claims 1 to 11 that comprises the following stages:

a) A reaction mixture is formed that contains at least the following compounds: at least one matrix that is selected from the group that is formed by the mineral matrices, preferably of oxide type, preferably amorphous or poorly crystallized and generally porous, at least one zeolite Y, at least partially dealuminified, whose mesh parameter is between 2.424 nm and 2.455 nm, and whose overall $\text{SiO}_2/\text{Al}_2\text{O}_3$ molar ratio is greater than 8, at least one element source of group VB, at least one element source of group VIB, at least one element that is selected from the group that is formed by the elements of group VIII, optionally water, optionally at least one source of an element that is selected from the group that is formed by silicon, phosphorus and boron, optionally at least one source of an element that is selected from among the halogens, i.e., the elements of group VIIA,

b) said mixture is kept at a heating temperature that is generally greater than about 40°C in the presence of a sulfur compound until a solid is obtained that contains at least one matrix, at least one dealuminified zeolite Y and at least one mixed sulfide phase.

14. Process according to one of claims 12 or 13 such that the sulfurization of the mixture is initiated at a temperature of between 40 and 700°, under autogenous pressure, and in the presence of CS_2 .

15. Use of the catalyst according to one of claims 1 to 11 or prepared according to one of claims 13 to 15 by hydrocracking feedstocks that contain hydrocarbon.

16. Use according to claim 15 in which the temperature is greater than 200°C, the pressure is greater than 0.1 MPa, the volume of hydrogen per volume of feedstock is at least 50 liters of hydrogen per liter of feedstock, and the hourly volumetric flow rate is between 0.1 and 20 volumes of feedstock per volume of catalyst and per hour.

17. Use according to one of claims 16 such that the feedstock is selected from the group that is formed by gasolines, gas oils, vacuum gas oils, residues that may or may not be deasphalted, paraffinic oils, waxes and paraffins, and it can contain heteroatoms such as sulfur, oxygen and nitrogen and at least one metal.